Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

REMARKS

The present application includes claims 1-25. Claims 1-25 were rejected. Claims 1, 11 and 21 are amended in response to Examiner's rejections.

Claims 1, 11 and 21 are amended to recite the additional limitation of selecting from a PACS database a first preprocessing function, wherein the first preprocessing function is stored in the PACS database and differs from a preprocessing function inserted in or applied to raw image data.

Claims 1, 8-9, 11-12 and 19-21 were rejected under 35 U.S.C. § 102(b) as being anticipated by the Huang textbook, *PACS: Basic Principles and Applications*.

Claims 2-4, 6, 13-15, 17 and 22-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of Takeo et al., U.S. Patent No. 6,231,246.

Claims 5, 7, 16, 18 and 24-25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang and Takeo, further in view of Vuylsteke.

Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Huang and Wofford.

The Applicant first turns to the rejection of claims 1, 8-9, 11-12 and 19-21 under 35 U.S.C. § 102(b) as being anticipated by Huang. Huang discloses a picture archiving and communication system ("PACS") that consists of image and data acquisition, a

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

PACS controller and archive and display subsystems (Huang, Ch. 7.1). The image and

data are generated by an imaging modality (Huang, Ch. 8.2). An acquisition gateway

computer acquires the image and data from the imaging modality (Huang, Ch. 8.2). The

PACS controller and archive acts as a database server and archive system (Huang, Ch.

7.1.2). The display subsystems display the received images (Huang, Table 7.2).

Huang describes the generation of a lookup table for mapping image data onto a

display monitor (Huang, Ch. 8.7.1.4). The Examiner has asserted in several instances

that the lookup table of Huang includes preprocessing functions; that is, "that the lookup

tables contain[] the preprocessing functions . . . ." (Advisory Action mailed August 18,

2003. p. 2-3; *see also* Office Action mailed November 14, 2003, p. 2, Office Action

mailed July 23, 2003, p. 2, Office Action mailed February 11, 2003, p. 3). Furthermore,

Huang describes the lookup table being built in and inserted into the image header and

applied at the time of display (Huang, Ch. 8.7.1.4). The Examiner has also asserted in

several instances that under Huang, "each image contains corresponding preprocessing

functions (in the image header). Therefore, the workstation inherently selects a

preprocessing function when it retrieves an image from the PACS database.

Furthermore, the workstation applies the lookup table (preprocessing functions) during

display . . . ." (Office Action mailed November 14, 2003, p. 3; *see also* Advisory Action

mailed August 18, 2003. p. 3). Therefore, assuming for the sake of argument that the

Examiner is correct in his analysis of Huang, then Huang describes the processing of

image data where functions stored within the image header and a display workstation

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

applies the functions of the lookup table inserted in the image header at a time of display. In this way, the display workstation is limited in the possible number of preprocessing or processing functions that may be applied at the display workstation to those in the lookup table inserted in the image header.

For example, if functions A, B and C of a lookup table are inserted into the image header, then, under the Examiner's reading of Huang, the display workstation necessarily must apply functions A, B and C. Conversely, Huang does not teach that the display workstation may choose a function D, that 1) is not contained or built into the image header, but instead stored in a PACS database and 2) that differs from preprocessing functions inserted in the image data header. In this way, Huang does not teach **selecting from a PACS database a first preprocessing function, wherein the first preprocessing function is stored in the PACS database and differs from a preprocessing function inserted in or applied to raw image data.**

Conversely, claims 1, 11 and 21 have been amended to recite the additional limitation of selecting from a PACS database a first preprocessing function, wherein the first preprocessing function is stored in the PACS database and differs from a preprocessing function inserted in or applied to raw image data.

The present rejection encompasses claims 1, 8-9, 11-12 and 19-21. Independent claims 1, 11 and 21 are amended to recite limitations not taught by Huang. Applicant

Page 12 of 21

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

respectfully submits that claims 1, 11 and 21 recite limitations not taught by Huang.

Consequently, the Applicant respectfully submits that independent claims 1, 11 and 21,

and corresponding dependent claims 8-9, 12 and 19-20 should be allowable.

The Applicant next turns to the rejection of claims 2-4, 6, 13-15, 17 and 22-23

under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of Takeo. Takeo

describes a method and apparatus for reproducing an image via two image reproducing

devices wherein gradation and/or sharpness correction is performed for both images

reproducing devices. Specifically, Takeo describes a method and apparatus that receives

an image signal, applies a first processing condition to the image signal for display on a

computer screen, applies a second processing condition to the same image signal for

printing the image on film, stores the two processing conditions, displays the image on

the computer screen and prints the image on film (col. 5, lines 64-68 and col. 6, lines 1-

31). Takeo therefore discloses applying a first processing condition so that the image

signal will be accurately displayed on a computer screen and applying a second

processing condition to the image signal so that the image signal will be accurately

recorded onto film from a laser printer (col. 5, lines 64-68 and col. 6, lines 1-31).

Therefore, Takeo describes the complete and full processing of image data for two

differing outputs, namely a computer printer and a screen.

Takeo does not teach selecting from a PACS database a first preprocessing

function, wherein the first preprocessing function is stored in the PACS database and

Page 13 of 21

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

differs from a preprocessing function inserted in or applied to raw image data.
Conversely, as described above, Takeo describes the application of two processing
conditions to fully and completely process image data to be displayed and printed (col. 5,
lines 64-68 and col. 6, lines 1-31). Moreover, Takeo does not describe, disclose or
employ any **preprocessing** function at all, much less a first preprocessing function
obtained from a PACS database and that differs from a preprocessing function inserted in
or applied to raw image data.

Thus, the Applicant respectfully submits that Takeo does not teach or suggest
the limitations of the claimed invention.

As described above, Huang describes a picture archiving and communication
system ("PACS") that consists of image and data acquisition, a PACS controller and
archive and display subsystems. Takeo does not remedy the shortcomings of Huang as
described above, either alone or in combination, **as neither describe selecting from a**
PACS database a first preprocessing function, wherein the first preprocessing
function is stored in the PACS database and differs from a preprocessing function
inserted in or applied to raw image data. Assuming for the sake of argument that one
would combine Huang and Takeo, the combination would result in an image processing
system, where two functions that fully and completely process an image for display on a
computer screen and for printing onto film are inserted in the image data header. The

Page 14 of 21

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

two fully processing functions would then be applied to the image data to fully process the image data at a computer screen and at a printer.

Thus, the Applicant respectfully submits a combination of Huang and Takeo does not teach or suggest limitations of the claimed invention.

The present rejection encompasses claims 2-4, 6, 13-15, 17 and 22-23. Claims 1, 11 and 21 have been amended to recite limitations not taught by either Huang or Takeo, alone or in combination. As claims 2-4, 6, 13-15, 17 and 22-23 depend from claims 1, 11 and 21, Applicant respectfully submits that claims 2-4, 6, 13-15, 17 and 22-23 recite limitations that are not taught by either Huang or Takeo, alone or in combination. Consequently, Applicant respectfully submits that claims 2-4, 6, 13-15, 17 and 22-23 should be allowable.

The Applicant next turns to the rejection of claims 5, 7, 16, 18 and 24-25 under 35 U.S.C. § 103(a) as being unpatentable over Huang and Takeo, further in view of Vuylsteke. Vuylsteke describes multiple processing of radiographic images based on a pyramidal image decomposition. Specifically, Vuylsteke describes processing a digital representation of an original image comprising the steps of transforming the image into a multiresolution representation, storing the representation in a memory, producing at least two differently processed images by applying at least two processing cycles, each cycle including: 1) retrieving the representation from the memory, modifying the representation

Page 15 of 21

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

at at least one resolution level and 2) obtaining the processed image by applying the inverse of a transform to the representation (col. 2, lines 33-56). That is, Vulysteke describes decomposing an image into multiple resolutions, each resolution becoming more coarse, or lower, than the previous resolution through an iterative process, applying some processing step to the image, then inversing the transform to the image (col. 3, lines 1-22, 52-68; col. 4, lines 1-12).

Conversely, Vulysteke does not describe selecting from a PACS database a first preprocessing function, wherein the first preprocessing function is stored in the PACS database and differs from a preprocessing function inserted in or applied to raw image data. Instead, as described above, Vulysteke describes the iterative decomposition of an image into multiple levels of lower resolution, the processing of the image, then applying the inverse of the transform that decomposed the original image (col. 3, lines 1-22, 52-68; col. 4, lines 1-12). That is, Vulysteke describes the decomposition of an image, followed by the complete processing of the image before transforming the decomposed and fully processed image.

Thus, the Applicant respectfully submits that Vulysteke does not teach or suggest the limitations of the claimed invention.

As described above, Huang describes a picture archiving and communication system ("PACS") that consists of image and data acquisition, a PACS controller and archive and display subsystems. Also as described above, Takeo describes a method and

Page 16 of 21

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

apparatus for reproducing an image via two image-reproducing devices wherein

gradation and/or sharpness correction is performed for both images reproducing devices.

Huang and Takeo do not remedy the shortcomings of Vulysteke as described above,

either alone or in combination, as **none describe selecting from a PACS database a**

first preprocessing function, wherein the first preprocessing function is stored in the

PACS database and differs from a preprocessing function inserted in or applied to

raw image data. Assuming for the sake of argument that one would combine Huang,

Takeo and Vulysteke, the combination would result in an image processing system,

where an original image is decomposed into a multiresolution representation and two

functions that fully and completely process the image for display on a computer screen

and for printing onto film are inserted in the multiresolution representation data header.

The inverse transform to the multiresolution representation would then be applied to the

representation and then the two fully processing functions would then be applied to the

image data to fully process the image data at a computer screen and at a printer.

Thus, the Applicant respectfully submits a combination of Huang, Takeo and

Vulysteke do not teach or suggest limitations of the claimed invention.

The present rejection encompasses claims 5, 7, 16, 18 and 24-25. Claims 1, 11

and 21 have been amended to recite limitations not taught by any of Huang, Takeo or

Vulysteke, alone or in combination. As claims 5, 7, 16, 18 and 24-25 depend from

claims 1, 11 and 21, Applicant respectfully submits that claims 5, 7, 16, 18 and 24-25

Page 17 of 21

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

recite limitations that are not taught by any of Huang, Takeo or Vulysteke, alone or in combination. Consequently, Applicant respectfully submits that claims 5, 7, 16, 18 and 24-25 should be allowable.

The Applicant next turns to the rejection of claim 10 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Huang and Wofford. Wofford describes a method for maximizing fidelity and dynamic range for a region of interest ("ROI") within digitized medical image display. Specifically, Wofford describes a method for converting sections of an image from a region of interest to 8-bit display pixel depth values while minimizing the reduction in quality of the original input image (col. 2, lines3-6). That is, the method of Wofford performs window and level functions on user-selected ROIs in an image (col. 4, lines 53-59).

However, Wofford does not teach selecting from a PACS database a first preprocessing function, wherein the first preprocessing function is stored in the PACS database and differs from a preprocessing function inserted in or applied to raw image data. Conversely, under Wofford, once a user selects an ROI, certain functions are automatically performed to 1) calculate a histogram, 2) calculate window and leveling values, 3) open a histogram window, 4) draw a histogram window and 5) calculate the minimum and maximum pixel values of a full resolution image (col. 4, lines 63-68; col. 5, lines 1-10). That is, Wofford does not describe the selection of a first preprocessing function at all, much less selecting from a PACS database a first preprocessing function,

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

wherein the first preprocessing function is stored in the PACS database and differs from a preprocessing function inserted in or applied to raw image data.

Thus, the Applicant respectfully submits that Wofford does not teach or suggest the limitations of the claimed invention.

As described above, Huang describes a picture archiving and communication system ("PACS") that consists of image and data acquisition, a PACS controller and archive and display subsystems. Huang does not remedy the shortcomings of Wofford as described above, either alone or in combination, as **neither describe selecting from a PACS database a first preprocessing function, wherein the first preprocessing function is stored in the PACS database and differs from a preprocessing function inserted in or applied to raw image data.** Assuming for the sake of argument that one would combine Huang and Wofford, the combination would result in an image processing system, where at least five functions relating to 1) calculating a histogram, 2) calculating window and leveling values, 3) opening a histogram window, 4) drawing a histogram window and 5) calculating the minimum and maximum pixel values of a full resolution image are inserted in raw image data. All of these functions would then be automatically applied to the image data upon display.

Thus, the Applicant respectfully submits a combination of Huang and Wofford does not teach or suggest limitations of the claimed invention.

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

The present rejection encompasses claim 10. Claim 1 has been amended to recite limitations not taught by either Huang or Wofford, alone or in combination. As claim 10 depends from claim 1, Applicant respectfully submits that claim 10 recites limitations that are not taught by either of Huang or Wofford, alone or in combination. Consequently, Applicant respectfully submits that claim 10 should be allowable.

Therefore, the Applicant respectfully submits that the claims of the present application should be allowable over the prior art.

Application No. 09/473,003
Attorney Docket No. 15-IS-5283 (12517US01)

CONCLUSION

The Applicant respectfully submits that all claims of the present invention should

be in condition for allowance. If the Examiner has any questions or the Applicant can be

of any assistance, the Examiner is invited and encouraged to contact the Applicant at the

number below.

The Commissioner is authorized to charge any necessary fees or credit any

overpayment to the Deposit Account of GTC, Account No. 502401.

Respectfully submitted,

Date: _____ January 30, 2004 _____   _Christopher R. Carroll_

                                                          Christopher R. Carroll
                                                          Registration No. 52,700

McANDREWS, HELD & MALLOY, LTD.
500 West Madison Street, 34th Floor
Chicago, IL 60661

Telephone: (312) 775-8000
Facsimile: (312) 775-8100